沪制01150234号

# Agilent G3437A Side-Mounted Thermal Conductivity Detector

## For the Agilent 7890A Gas Chromatograph

## Installation Instructions

## Parts Supplied

**Table 1** Parts supplied

| Description | Quantity |
|---|---|
| 1/8" Bulkhead Union, 316 SST (with 2 Swagelok nut and ferrule) | 1 |
| Bulkhead Fitting Retainer, 316 SST | 1 |
| Screw, flathead, M4 × 0.7 10mm (long, for side cover) | 2 |
| Screw, machine, M4 × 0.7 12mm (for bezel, frame support, bulkhead fitting retainer, flow frame, TCD module, EPC module, PCB cover) | 18 |
| Captive screw, M4 × 0.7 12mm (long, for flow frame top) | 2 |
| Captive screw, M4 × 0.7 (for solenoid valve bracket) | 2 |
| 1/8" nut and ferrule set brass, Swagelok (for EPC module and T-manifold) | 2 |
| Wrist strap, disposable 4-LG 1-W | 1 |
| T-manifold assembly | 1 |
| Manual flow bezel | 1 |
| AUXZONE/VLV BOX cable | 1 |
| MSD HTD ZONE cable | 1 |
| Blank Label Plate | 2 |
| Cable, switching valve | 1 |
| Solenoid valve bracket | 1 |
| Bracket (3rd EPC) | 1 |
| Frame (3rd TCD) | 1 |
| PCB Cover (3rd TCD) | 1 |
| Third detector flow | 1 |
| Third detector box cover assembly | 1 |
| Third detector EPC communication cable | 1 |

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**Table 1** Parts supplied (continued)

| Description | Quantity |
|---|---|
| Third detector heated zone cable | 1 |
| Third TCD module | 1 |
| TCD PCB | 1 |
| Frame support | 1 |
| Corner bracket | 1 |
| Bolt and nuts (for corner bracket) | 2 |

## Parts Identification

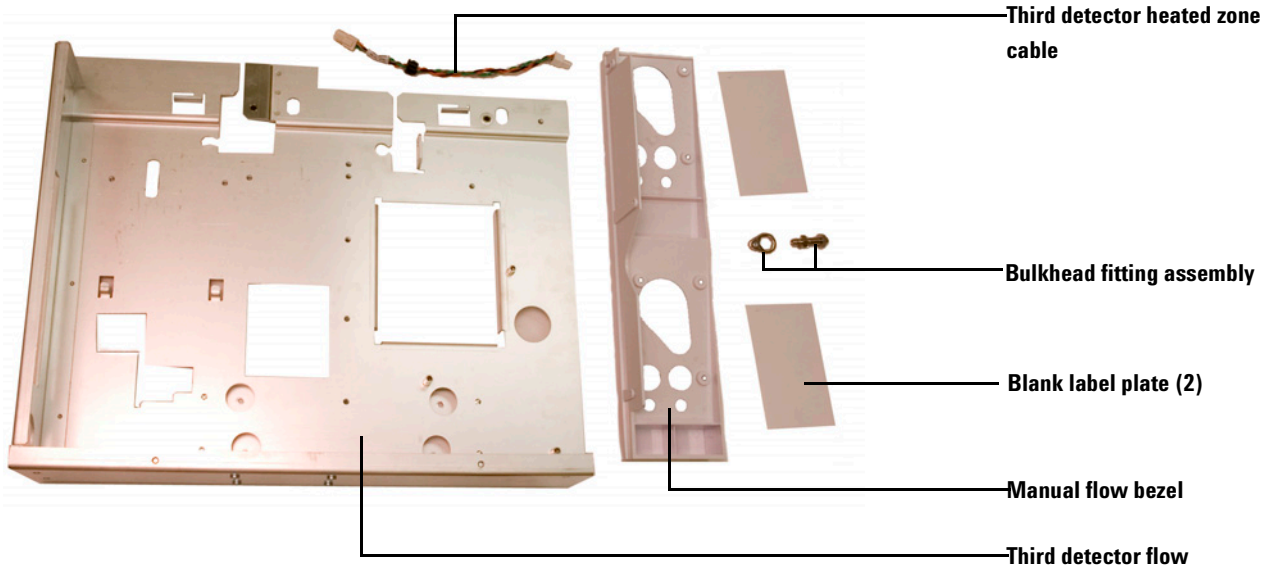


**Figure 1** TCD frame parts identification

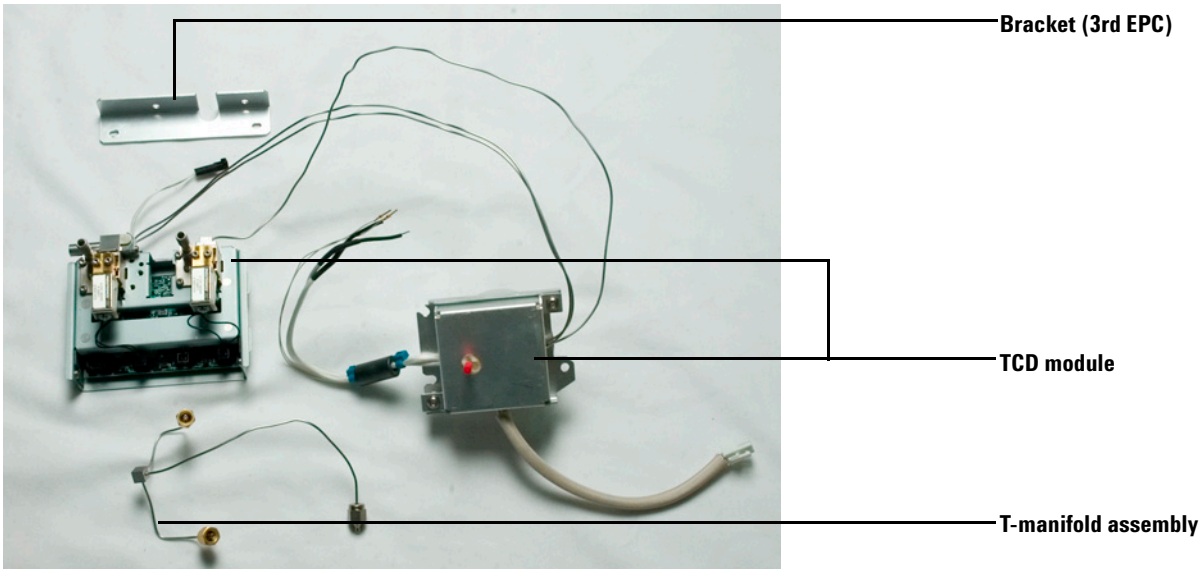


**Figure 2** TCD module parts identification

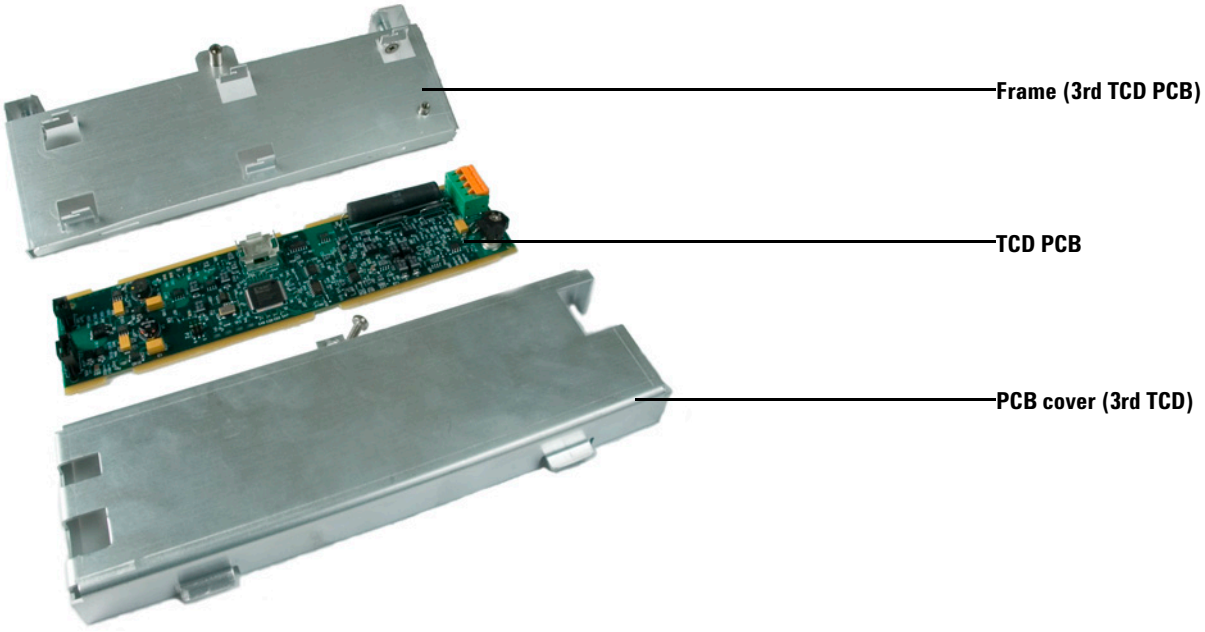


**Figure 3** TCD board assembly

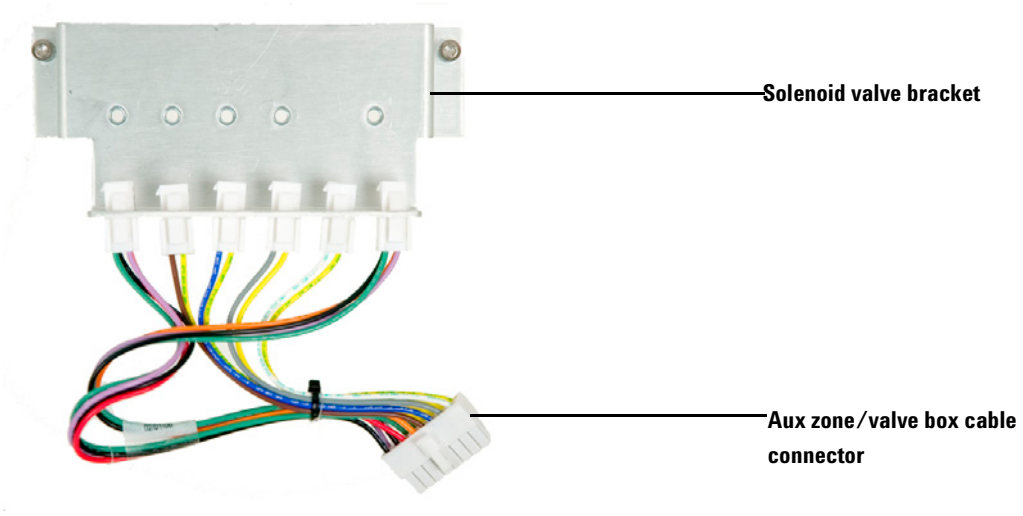


**Figure 4** Solenoid valve bracket and aux zone/valve box cable

## Tools Required

- T-10 and T-15 Torx drivers
- Phillips head screwdriver
- Small, flat-blade screwdriver
- 1/8” wrench

## Installation Procedure

This procedure explains how to install the thermal conductivity detector (TCD) accessory as a third detector on the Agilent 7890A Gas Chromatograph (GC).

**WARNING** **Refer to the Safety Manual that came with your Agilent 7890A Gas Chromatograph for hazards that may exist when maintaining your instrument.**

### Prepare the GC

1. Turn off the GC and unplug the power cord.
2. Unsnap the pneumatics cover by pressing the black clips on the sides of the cover. Lift the cover up and off.
3. Remove the detector cover by raising the cover vertically and then firmly lifting up on the right side of the cover to free the lid from the hinge pin. Slide the pin out of the hole on the left side hinge and put the cover aside.
4. Remove the top right electronics cover by loosening one screw located in the left front side. Open the cover 90 degrees and lift up on the right side. Slide the cover off the pin on the left side.
5. Detach the rear top cover by removing the four screws. Slide the top cover to the left until free, gently tilting out the lower cover when it interferes with removal.
6. Remove the electronics side cover by unscrewing the single top screw. Slide the cover to the right and lift off.
7. Remove the left side cover by loosening the top screw, sliding the panel towards rear, and lifting the cover off.
8. Put on the wrist strap and attach the ground to the GC frame sheet metal for electrostatic protection.

## Install the solenoid valve bracket

1. Skip to step 6 if the solenoid valve bracket is already installed on your GC.
2. Insert the four smaller valve plugs and two larger aux heater plugs into the slots in the solenoid valve bracket. See connections in figure 5.
3. Connect the aux zone/valve box cable connector into the analog and power (A&P) board.
4. Align the solenoid valve bracket so the cables are coming from the bottom of the bracket and the screws are located at the top over the screw holes in the frame. See Figure 5.
5. Tighten the captive screws into the frame.
6. Connect the MSD heated zone cable (long) to the bracket in the first (A1) or last (A2) position. Record its position for use in the final configuration.

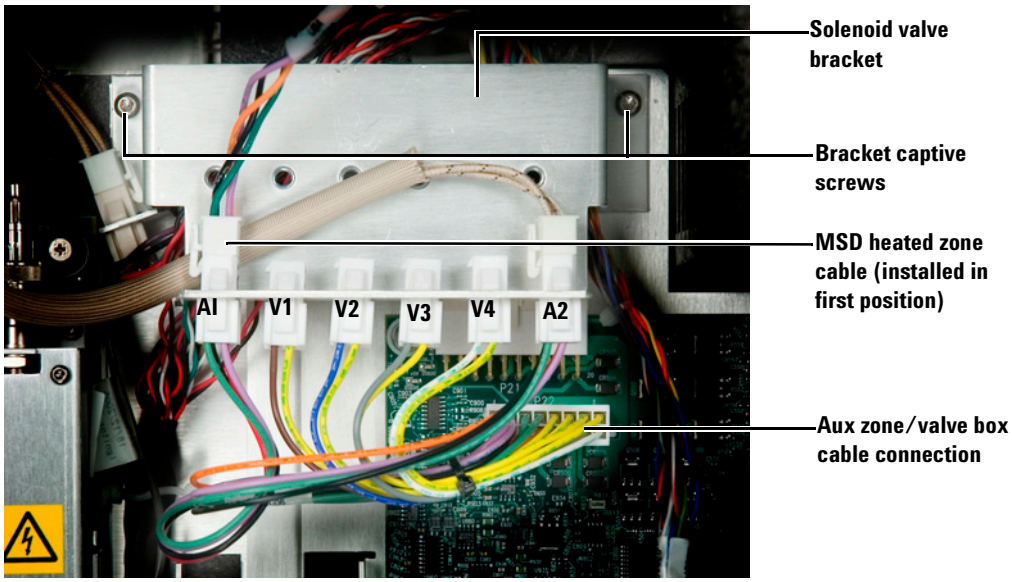


**Figure 5** Aux zone/valve box cable and solenoid valve bracket installed

## Install the MSD heated zone cable (long)

1. Thread the MSD heated zone cable (long) across the top of the GC, passing under the detector gas lines and through channels to the right side of the instrument.

2 Unfasten the main communication grommet and include the MSD heated zone cable in the bundle. Refasten the grommet.

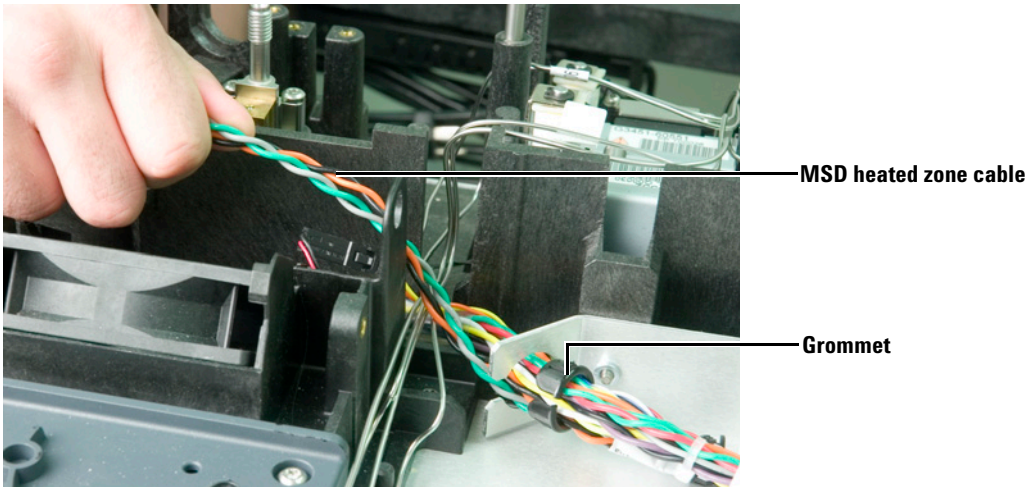


**Figure 6** MSD heated zone cable included in main communication grommet

3 On the left side, unfasten the grommet and include the MSD heated zone long cable. Leave the grommet unfastened until the communication cable is routed at the end of the installation procedure.

## Assemble the TCD frame

1 Attach the manual flow bezel to the third detector flow frame with three M4 × 12 mm screws.

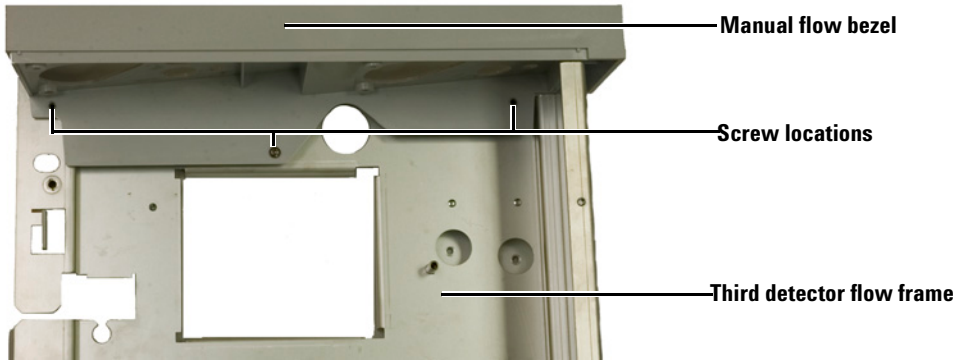


**Figure 7** Attaching the manual flow bezel to the third detector flow frame

2 Attach the frame support by screwing four screws through the bezel into the support.

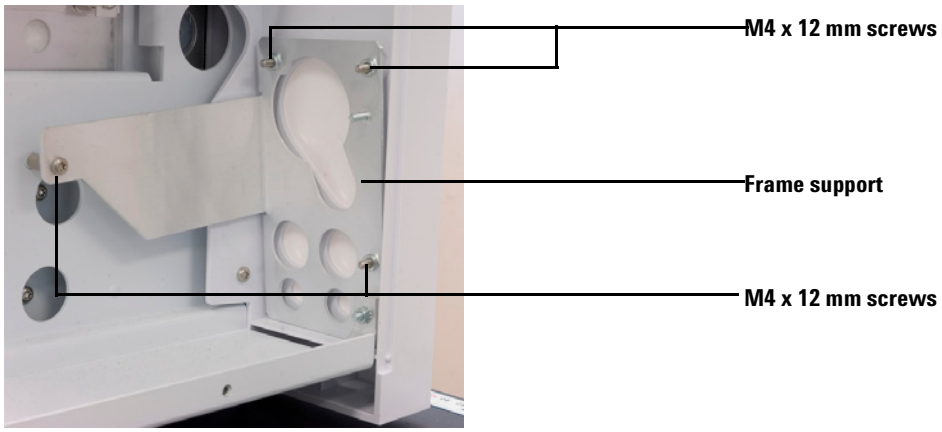


**Figure 8** Frame support installed

3 Attach the corner bracket, using bolts and nuts, between the bezel and frame.

**Figure 9** Corner bracket installed

4 Attach the two blank label plates to the front side of the bezel to completely cover the holes.

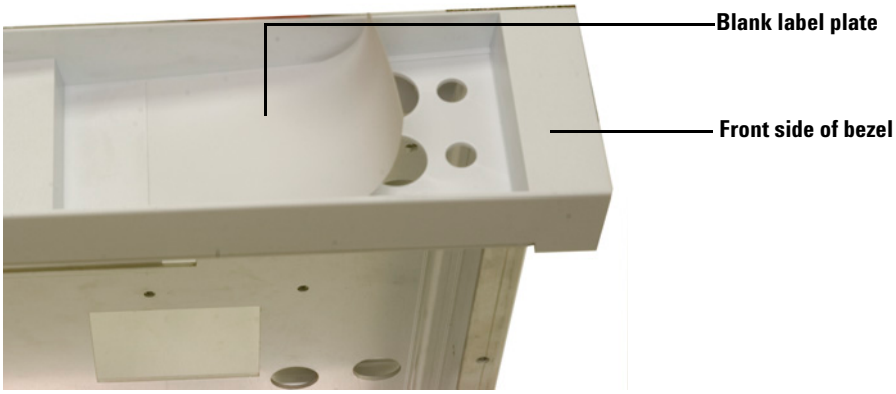


**Figure 10** Attaching the two blank label plates

5 Attach the third detector heated zone cable (short) to the frame by inserting the cable plug into the sheet metal notch, inserting the cable into the grommet, and sliding the grommet into the cutout on the frame.

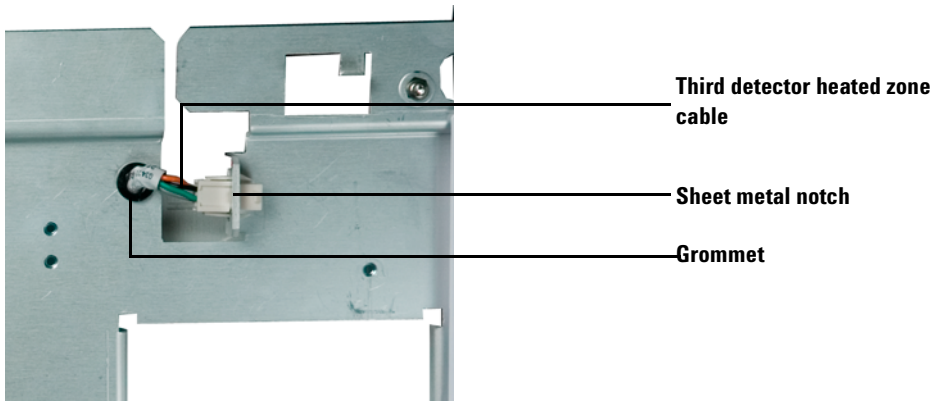


**Figure 11** Third detector heated zone cable installed in frame

6 Attach the bulkhead fitting retainer to the rear facing side of the frame by tightening the screw. See Figure 12.

7 Insert the bulkhead fitting through the frame so that the fixed nut is positioned in the retainer.

8 Secure the fitting by attaching and tightening the backing nut.

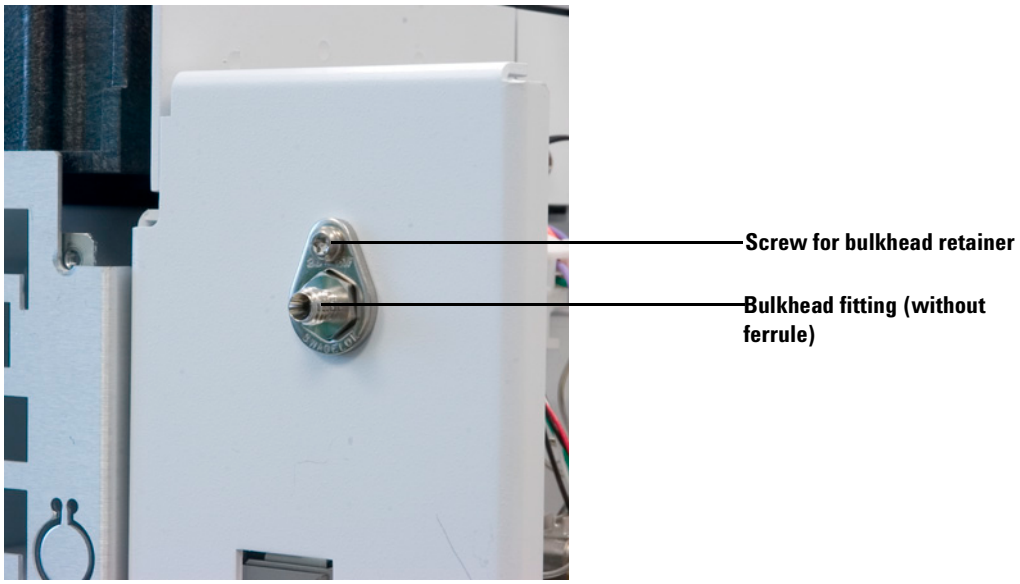


**Figure 12** Bulkhead fitting installed in frame

## Prepare the detector mounting

1 Locate the position on the side of the GC for the detector. Remove the round metal cutout at this location using diagonal cutters. Make the cuts so that the metal nubs remain attached to the discarded metal circle.

2 Remove and discard the circular insulation plug.

3 Using the flat screwdriver, punch a hole (approximately ¼-in ID) in the oven insulation.

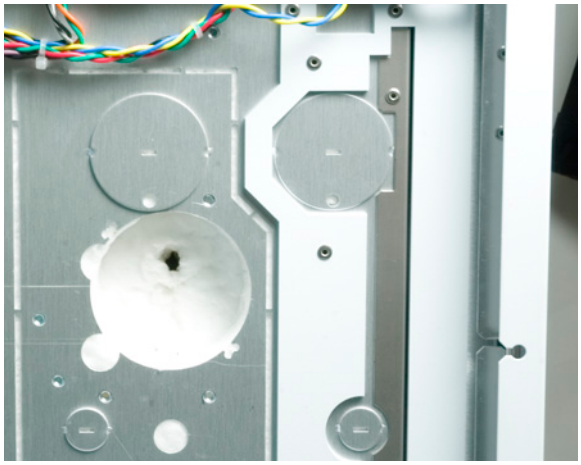

**Figure 13** Metal cutout removed and hole punched in oven insulation

## Attach the third detector flow frame

1. Connect the third detector heated zone cable (attached to the back of the third detector flow frame) to the MSD heated zone cable (long), which was attached to the GC in a previous step.
2. Orient the third detector flow frame with the GC by positioning the circular cutouts at the bottom edge of the frame with the four screw holes at bottom edge of the GC.
3. Using a Torx driver, attach the frame first with two 4 mm × 12 captive screws at the top edge of the frame and then with four screws through the circular cut outs at the bottom edge of the frame.

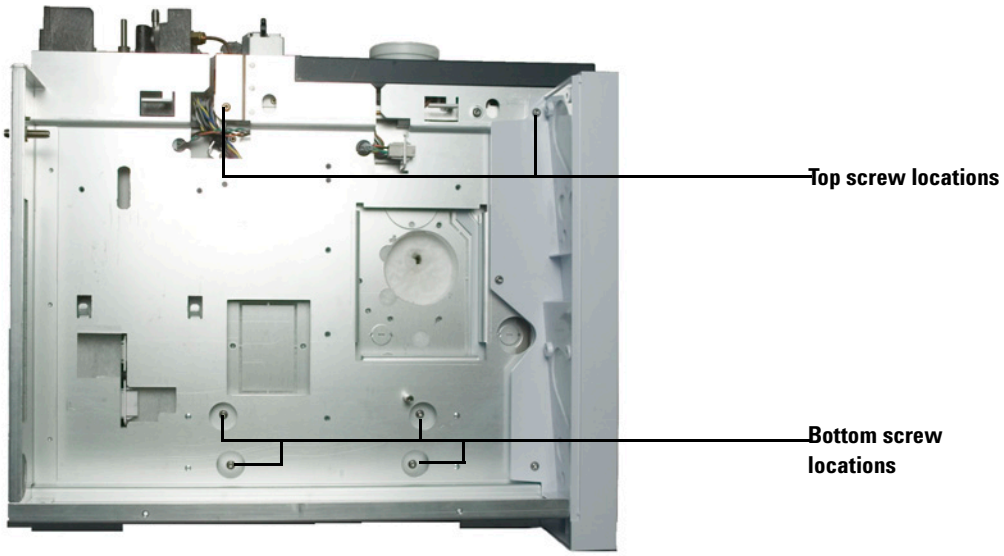


**Figure 14** Third detector flow frame mounted to GC

## Attach the frame (3rd EPC)

1 Remove the two Torx screws from the top of the module.

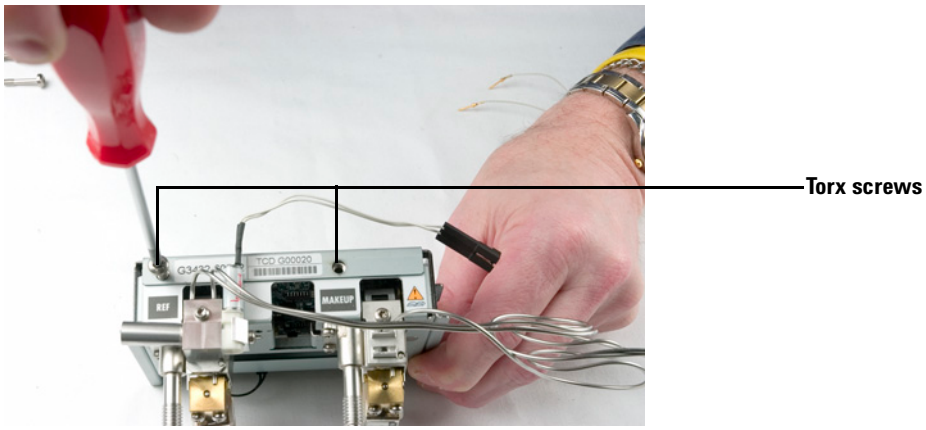


**Figure 15** Removing the two Torx screws from the module

2 Position the bracket (3rd EPC) on the top of the module with the switching valve wire passing through the bracket cutout.

3 Attach the bracket (3rd EPC) to the module with the screws.

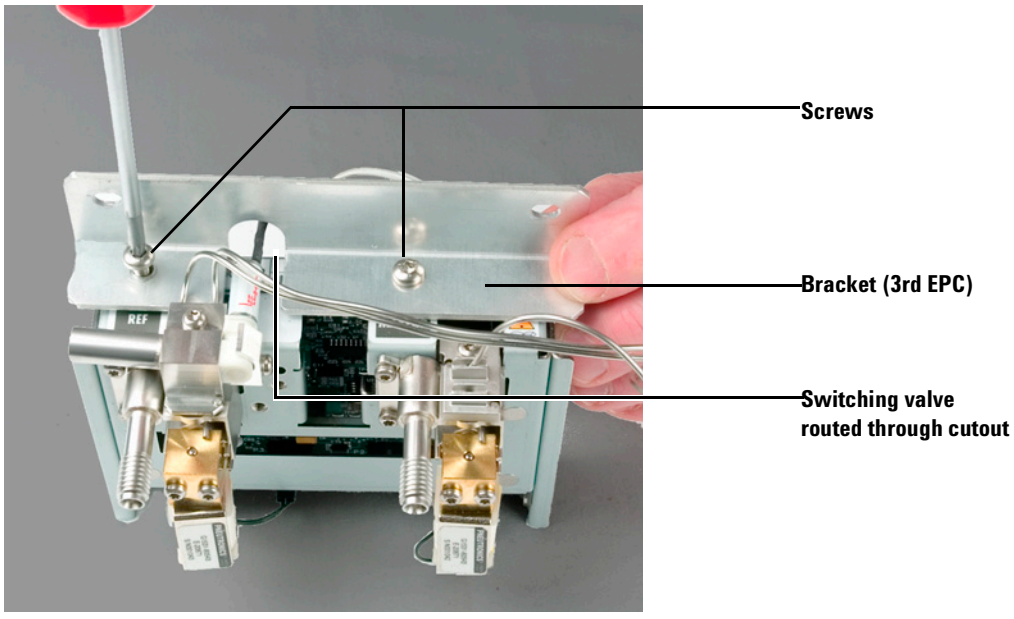


**Figure 16** Attaching the bracket (3rd EPC) to the module

## Install the TCD module

1 Temporarily rest the detector module on the floor of the third detector flow frame. Slide the bottom cage of the EPC module into the supporting slots on the frame.

2 Tilt the EPC module forward slightly and position the switching valve wire in the frame cut out slot, making sure that it is not pinched when the module is in place against the instrument. See Figure 17.

3 Attach the EPC module to the frame at the two upper screws.

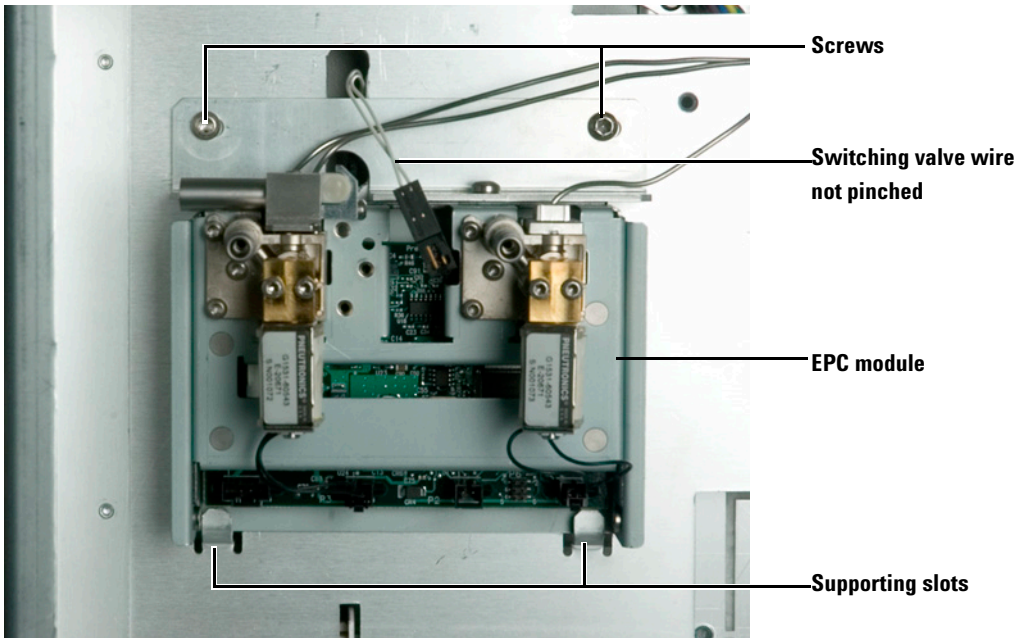


**Figure 17** Installed EPC module

4 Place the detector over the circular detector cut out.

5 Attach the detector to the GC by using three Torx screws.

6 Connect the TCD heater cable to the third detector heated zone cable plug located on the third detector flow frame wall above the detector. Tuck the cable between the side of the GC and the bezel. See Figure 18.

7 Orient the pneumatics tubing downwards so that it doesn't interfere with the TCD board installation.

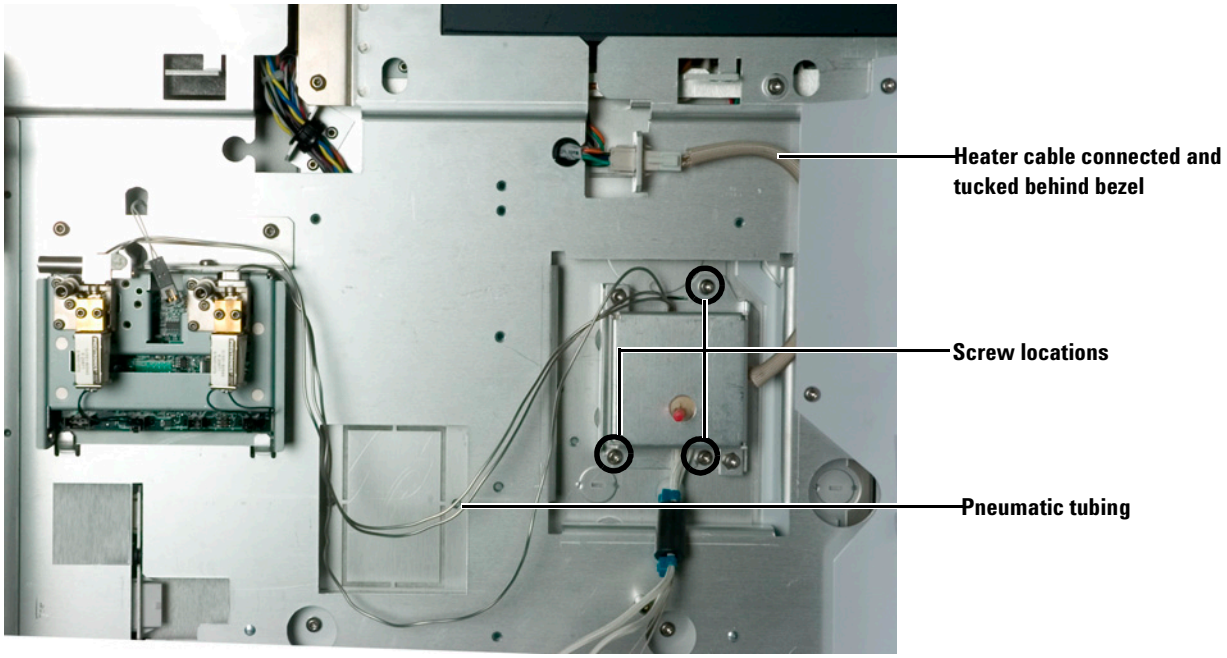


**Figure 18** TCD module installed

## Attach the T-manifold assembly

1 Using a 1/8" nut and ferrule, attach one end of the T-manifold assembly short tubing arms to the EPC module reference gas fitting.

2 Using a 1/8" nut and ferrule, attach one end of the T-manifold assembly short tubing arms to the EPC module makeup gas fitting.

3 Using a 1/8” nut and ferrule, attach the long end of the T-manifold assembly tubing arm to the bulkhead fitting.

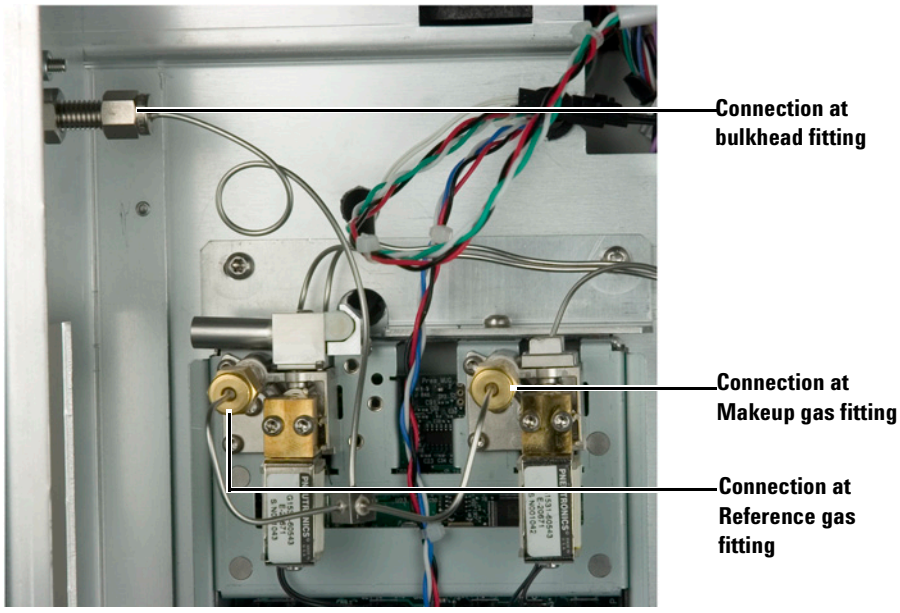


**Figure 19** T-manifold assembly installed

## Attach the frame (3rd TCD)

Position the frame with the flat surface facing up and the captive screws below. Align the frame with the holes in the GC and tighten the captive screws.

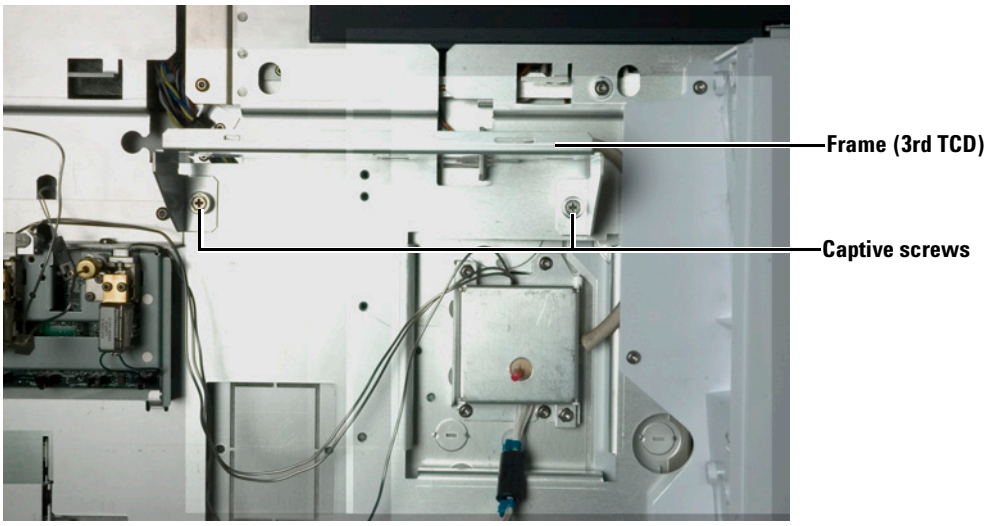


**Figure 20** Frame (3rd TCD) installed

## Attach the TCD board

1. Remove the TCD logic board from its static control bag.
2. Align the TCD board with the frame (3rd TCD) so the board circuits are facing up and the board notches are to the left of the frame hooks.
3. Slide the TCD board under the hooks so that all the slots engage all the hooks and the board lies flat and evenly on the frame. Align the thumb screw directly over the screw hole.
4. Attach the TCD board to the frame by tightening the thumb screw.

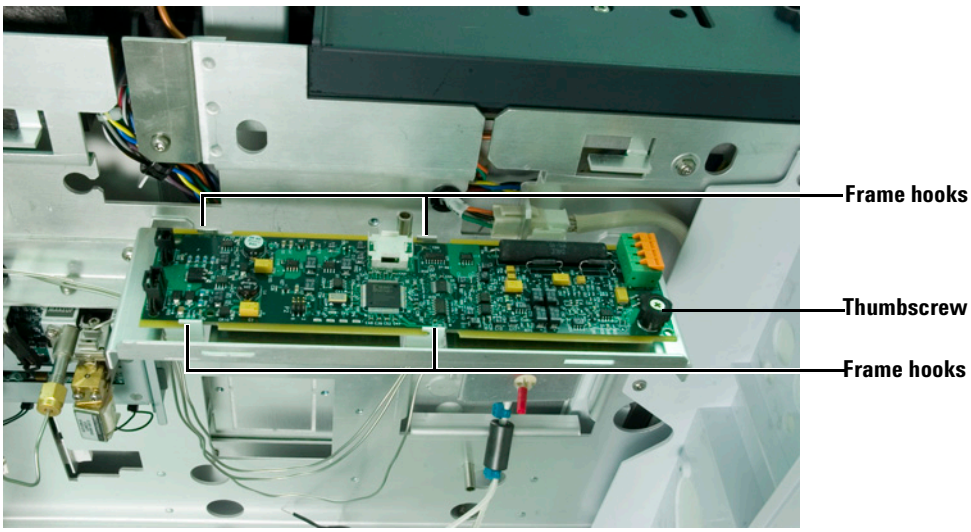


**Figure 21** TCD board attached to frame (3rd TCD)

## Attach the PCB cover

1. Insert the PCB cover tabs into the frame (3rd TCD) slots and tilt the cover into position over the board.
2. Fasten the cover with a Torx screw.

3 Attach the filament leads (thick black wire sheath) and the ΔPRT leads (thin white wire sheath) from the TCD to the TCD board as the configuration shown in Figure 22. Using a small flat-blade screwdriver to push on the connector tabs, firmly push away from the connector hole, insert the appropriate lead into the connector hole, and release the tab to complete the connection.

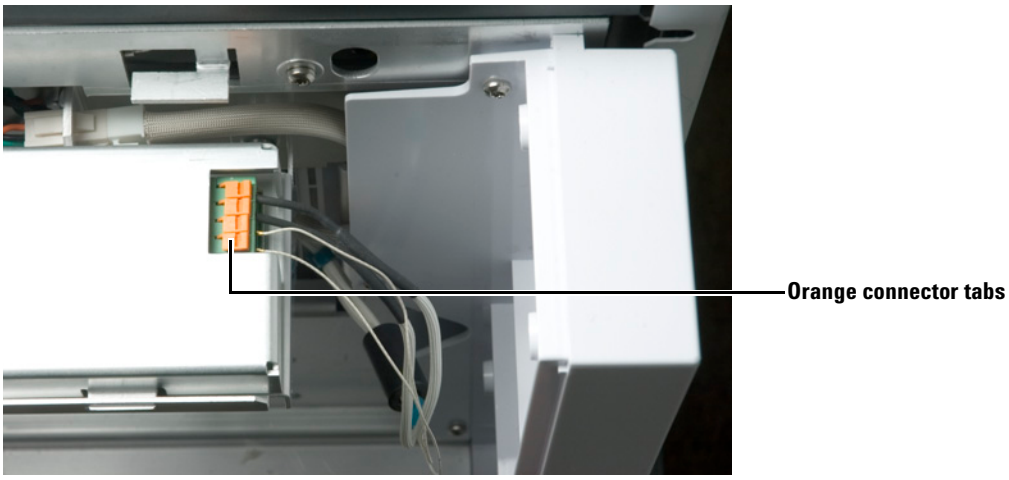


**Figure 22** TCD connected to TCD board

## Route the communication bus cable

1 Connect the plug on the communication cable labeled Aux DET2 to the plug labeled AuxDET2 in the EPC module area.

2 Connect the plug on the communication cable labeled EPC5 to the plug labeled EPC5 in the EPC module area.

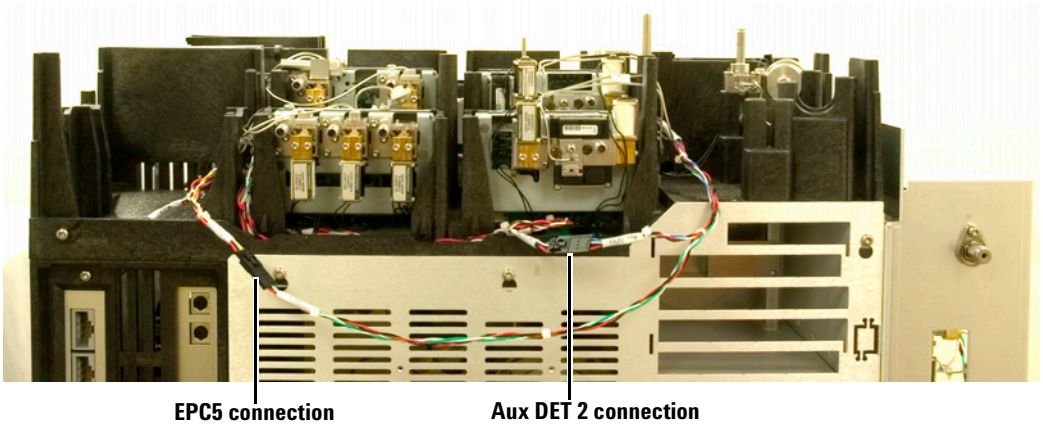


**Figure 23** Communication bus cable connections

3 Thread the cables from the EPC module area behind the pneumatics area to the third detector flow frame.

4 Bundle the MSD heated zone cable and the communication cable with the existing cables using the grommet located in the side carrier frame directly above the EPC module. Refasten the grommet in the cutout.

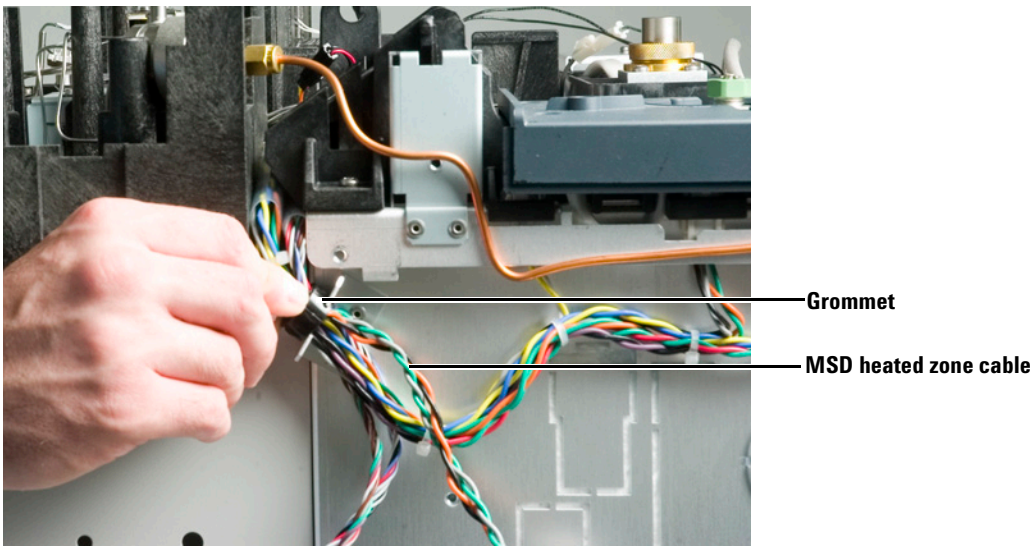


**Figure 24** MSD heated zone cable included in left side grommet

5 Connect the TCD switching valve cable to the switching valve lead on the EPC module. Connect the other end of the TCD switching valve cable to the board in the back left connector. See Figure 25.

6 Connect the Third DET EPC cable to the communication connector on the EPC board. See Figure 25.

7 Connect the Third DET cable to the TCD board in the bottom connector.

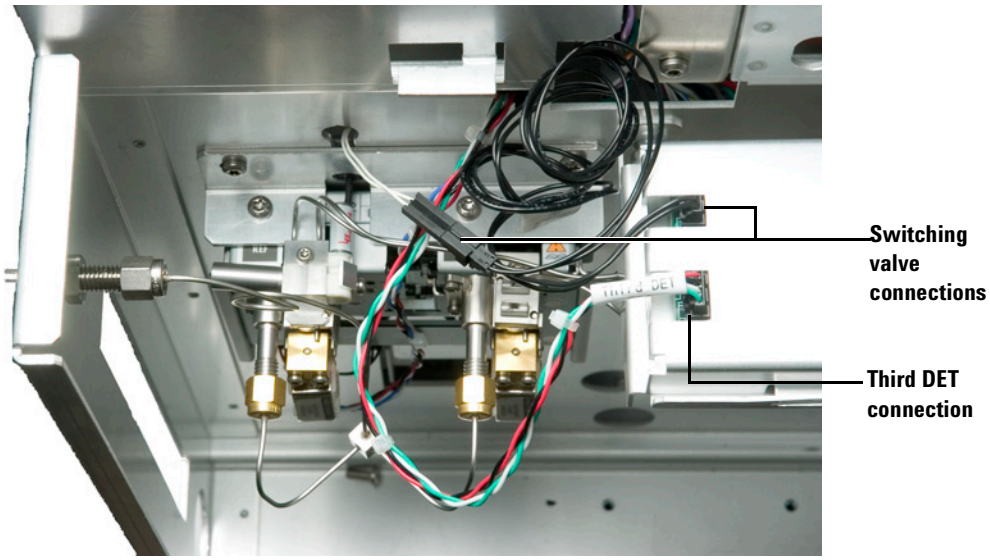


**Figure 25** TCD module cable connections

## Restore the GC to operating condition

1 If installed, remove the red TCD cap on the TCD exhaust.

2 Install the third detector side cover using two Torx flathead screws.

3 Replace the top and side panels.

4 Plug in the GC and turn on the power.

5 On the GC keypad, press **[Configure]** then **[Aux Det #]**.

6 Select the Aux Detector and press **[Enter]**.

7 On the keypad, press **[Mode/Type]**.

8 Scroll to select the Aux Heater and press **[Enter]**. The GC displays a prompt to select a heater to install. Select **Aux 1** if you attached the MSD heated zone cable to plug A1 and select **Aux 2** if you used plug A2. A caution message will appear instructing you to reboot.

9 Reboot the GC.

   a Press **[Options]**.

   b Scroll to **Communications** and press **[Enter]**.

   c Scroll to **Reboot the GC?** and press **[On/Yes]** twice to reboot the GC and have the changes take effect.

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**Warranty**

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